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Effects of bed support and positioning techniques in prevention of bedsores

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Abstract
Introduction: Pressure ulcer is a significant health care problem despite considerable investment in education, training, and prevention equipment.
Material and Methods: Observational study conduction 50 subjects with convenient sampling for 6 weeks, measuring scale used as study tool.
Result: Paired T test used for pre and post evaluation (width of bedsore)
Conclusion: Positioning of the subject with the air mattress/water bed and only air mattress/water bed effect was being observed to reduce the pressure ulcers.

Keywords: Bed support, pressure ulcer, positioning

Introduction
"A pressure ulcer (PU) is defined as a localized injury to the skin and/ or underpinning towel generally over a bony elevation, as a result of pressure, or pressure in combination with shear." Pressure ulcer is a significant health care problem despite considerable investment in education, training, and forestalment outfit. The impact of pressure ulcers on the existent is profound. Changing demographics prognosticate an increase in the aged population in the future; thus, owing to the liability of an associated increase in health care problems.
These ulcers do at bony areas of the body similar as the ischium, lesser trochanter, sacrum, heel, malleolus (side further than medium), and crown. Substantially do in people with conditions that drop their mobility making postural change delicate. Bedsores can develop over hours or days. Utmost blisters heal with treatment, but some no way heal fully. You can take way to help scrapes and help them heal.
Loss of sensitive perception, locally and general disabled loss of knowledge, along with dropped mobility, are the most important causes that aid in the conformation of these ulcers (cases are not apprehensive of discomfort hence don't relieve the pressure). Both external and internal factors work contemporaneously, forming these ulcers.

- **External factors:** pressure, friction, shear force, and moisture
- **Internal factors:** fever, malnutrition, anaemia, and endothelial dysfunction speed up the process of these lesions.

Dragged pressure on tissues can beget capillary bed occlusion and, therefore, low oxygen situations in the area. Over time, the ischemic towel begins to accumulate poisonous metabolites. Latterly, towel ulceration and necrosis do.

Threat Factors are

- **Immobility:** This might be due to co-morbidity and other causes.
- **Incontinence:** Skin becomes more vulnerable with extended exposure to urine and coprolite.
- **Lack of sensitive perception:** Spinal cord injuries, neurological diseases and other conditions can affect in a loss of sensation. An incapability to feel pain or discomfort can affect in not being apprehensive of advising signs and the need to change position.
- **Poor nutrition and hydration:** People need enough fluids, calories, protein, vitamins, and minerals in their diurnal diets to maintain healthy skin and help the breakdown of tissues.

Medical conditions affecting blood inflow

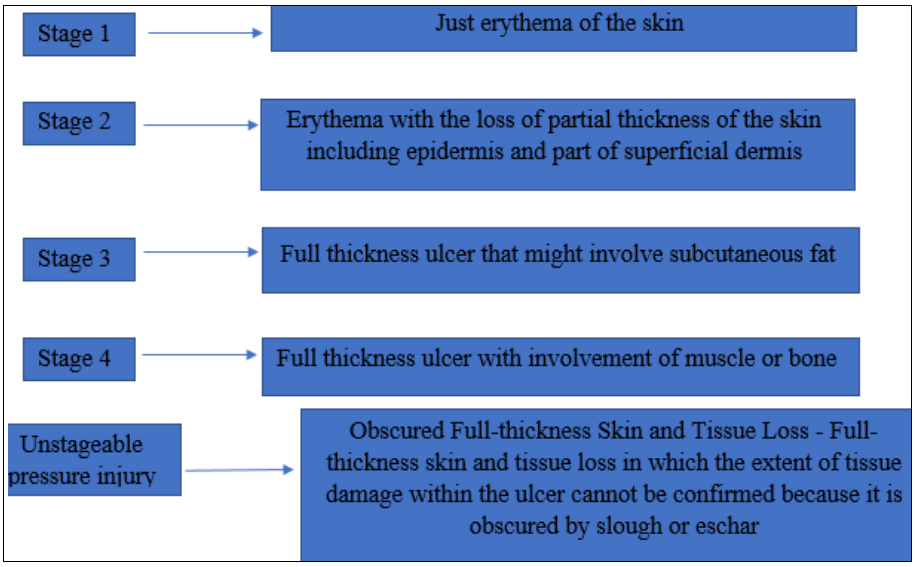
Health problems that can affect blood inflow, similar as diabetes and vascular complaint, can increase the threat of towel damage similar as scrapes.

Causes

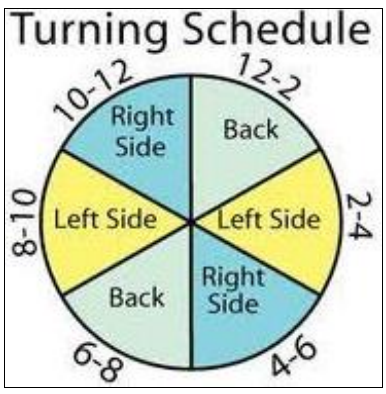
Dragged pressure is basically the main cause of a decubitus ulcer. Lying on a certain part of the body for longer period beget break down of the skin. Other causes also include poor rotation, inordinate humidity, skin annoyances like urine and faeces, disunion similar as when a case who is confined to bed has wastes dragged from under them. Numerous factors contribute to the development of pressure ulcers, but pressure leading to ischemia and necrosis is the final common pathway. 1) Result from constant pressure sufficient to vitiate original blood inflow to soft towel for an extended period. 2) External pressure must be lesser than the arterial capillary pressure (32 mm Hg) to vitiate flux for an extended time. 3) Lesser than the venous capillary ending pressure (8- 12 mm Hg) to stymie the return of inflow for an extended time. 4) Tissues are able of opposing enormous pressures for brief ages, but dragged exposure to pressures just slightly above capillary stuffing pressure initiates a downcast helical toward towel necrosis and ulceration. 5) The superficial dermis can tolerate ischemia for 2 to 8 hours before breakdown occurs. 6) Deeper muscle, connective towel, and fat tissues tolerate pressures for 2 hours or lower (presumably because of its increased need for oxygen and advanced metabolic conditions). Frequently there's significant damage to underpinning tissues while the epidermis and dermis remain complete. 7) By the time ulceration is present through the skin position, significant damage of underpinning muscle may formerly have passed, making the overall shape of the ulcer an inverted cone. 8) disunion caused by skin rubbing against shells like apparel or coverlet can also lead to the development of ulcers by contributing to breaks in the superficial layers of the skin. 9) humidity can beget ulcers and worsens being ulcers via towel breakdown and maceration.

Complications

- **Cellulitis:** Cellulitis is an infection of the skin and connected soft tissues. It can beget warmth, inflammation and lump of the affected area. People with whim-whams damage frequently do not feel pain in the area affected by cellulitis.
- **Bone and common infections:** Common infections (septic arthritis) can damage cartilage and towel. Bone infections (osteomyelitis) can reduce the function of joints and branches**.**
- **Cancer:** Long- term, non-healing injuries (Marjolin's ulcers) can develop into a type of scaled cell melanoma.
- **Sepsis:** Infrequently, a skin ulcer leads to sepsis.
- **Pressure sore grading:** Scrapes fall into one of several stages grounded on their depth, inflexibility, and other characteristics. The degree of skin and towel damage ranges from changes in skin colour to a deep injury involving muscle and bone. Pressure ulcers are distributed into four stages that are as follows:



The first clinical sign of pressure ulceration is blanchable erythema along with increased skin temperature. However, tissues may recover in 24 hours, if pressure is relieved. However, non-blanchable erythema occurs, If pressure is unrelieved. Progression to a superficial bruise, fester, or shallow crater indicates involvement of the dermis. Bleeding is minimum, and tissues are indurated and warm. Eschar conformation marks full- consistence skin loss. Tunnelling or undermining is frequently present. Prevention should include the identification of at- threat cases and the preface of preventative interventions acclimatized to the case. Primarily, the interventions should concentrate more on forestalment rather than treatment of bedsores.



The case should move or turn every 2 hours; it could not be done by themselves, or they should ask someone to help them. 1) Reducing pressure on areas that may be susceptible to pressure ulcers by using a special air or gel mattress, padding that protects bony areas, like the elbows or ankles, a wheel president bumper. 2) Have acceptable food input acceptable and it should correspond of a balanced and healthy diet. 3) Regularly check for scrapes when the case is immobilised.

The decision to use pressure distributing coffers is determined by threat assessment, patient comfort, general health, training, and the vacuity of accoutrements and coffers. International and public guidelines recommend regular displacing to help bedsores. Repositioning must be performed in cases with an increased threat of bedsores.

Nursers give care, examiner cases, and notify the platoon of issues. nursers' helpers are frequently responsible for turning and displacing cases. Air- fluidized or froth mattresses should be used, frequent postural changes, provision of acceptable nutrition, and treatment of any underpinning systemic ails.

Air mattresses help to avoid skin breakdown by promoting blood inflow and stimulating rotation in the body air mattresses alternate the body's positioning regularly so that the pressure doesn't make up too much on corridor of the body that are prone to pressure blisters similar as the buttocks, elbows, back, and hips. It's also easier to maintain than a regular mattress, it's movable and durable. An air mattress is designed to help & treat scrapes or pressure injuries. It's constructed with multiple exaggerated air tubes that inflate and deflate by emulating the case's body movement. The inflating & deflating of the bubbles helps release the pressure under the case's body, especially for the corridor like elbows, heels, shoulders & hips. The air mattress helps in the proper air rotation & prevents bed ulcers caused due to pressure. All the bedridden cases bear air mattresses to help scrapes, there are different situations of scrapes that bear different kinds of attention depending upon their inflexibility

Waterbeds encourage blood rotation, helping to flush contaminations from the bodies system while you are sleeping. The tepid mattress also soothes sore muscles, relieves pressure, and helps relieve backaches. These ulcers are delicate and precious to treat and can occasionally indeed affect in death. Through the use of a waterbed, a person can help the conformation of decubitus ulcers. Cases who have formerly formed ulcers can anticipate more rapid-fire mending when switched to a waterbed. This mending may be over to three times faster than without the use of a waterbed.

In our care centre the norm is to use air mattresses and water beds on top of the regular sanatorium bed/ froth for cases with bed blisters which would be carried out by positioning of the cases every two hours noting the effect of both (air/ water mattress and positioning) contemporaneously.

Aim

To assess the effects of bed support and positioning techniques in prevention of bedsores/pressure ulcers**.**

Objectives

The objective of this study was to identify, assess, and to prevent the development of bedsores.

Methodology

Study design

Observational study conduction 50 subjects with convenient sampling for 6 weeks, measuring scale used to measure the width of bedsores. To establish the range and extent of prevention of bedsores in elderly population.

Inclusion criteria

a) Subjects who are bedridden.
b) In age group between 60 to 80 years.
c) Subjects having grade 1 bedsore.
d) Subjects who are willing to participate in this study.

Exclusion criteria

a) Subjects who are not co-operative.
b) Subjects not having any mobility and deformities.
c) Patients having grade 2,3,4 bedsores.

Procedure

a) Permission was taken from institutional ethical committee of Tilak Maharashtra Vidyapeeth, Pune.
b) Participants were included according to study's inclusion and exclusion criteria.
c) The aim and objectives were explained to participants.
d) Consent was taken from the participants.
e) Explanation of the study was explained to participants.
f) Participants willing to give consent to participate in the study were included.
g) Collected data was statistically analysed.

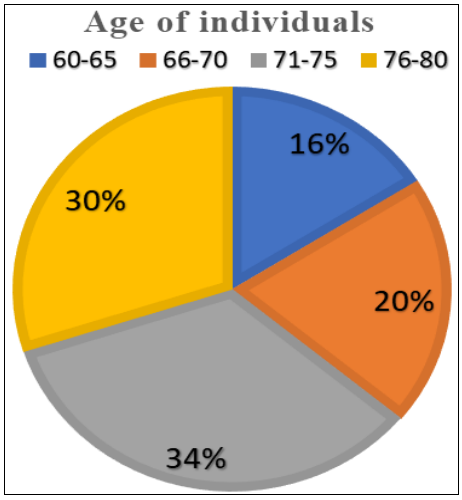
Program

Subjects were divided in two groups (A and B), group "A" was given bed support with positioning after every 2 hours and group "B" was given only bed support for 6 weeks the changes were observed, to know if any effects were seen.

Result

Table 1: Distribution of subjects according to age group

Age group	No. of individuals
60-65	8
66-70	10
71-75	17
76-80	15



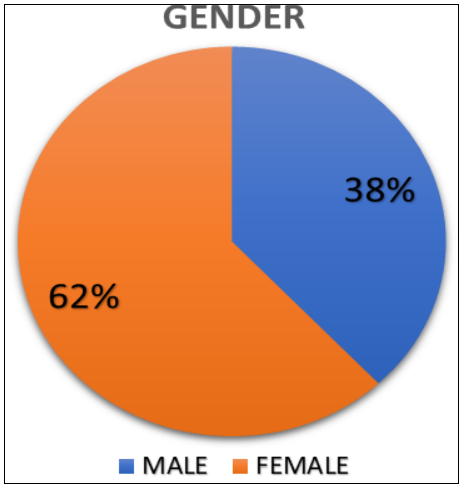
Graph 1: Distribution of subjects according to age group.

Interpretation

The above graph represents that 16% belongs to 60-65 age group, 20% belongs to 66-70 age group, 34% belongs to 71-75 age group, and 30% belongs to 76-80 age group.

Table 2: Distribution of subjects according to gender.

Gender	No. of individuals
Male	19
Female	31

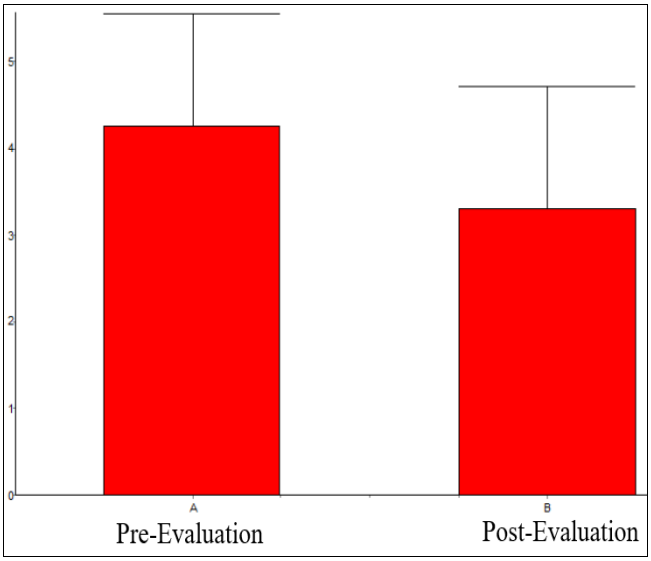


Graph 2: Distribution of subjects according to gender

Interpretation: The above graph represents, out of 50 number of individuals, 62% population being females (31 individuals) and 38% population being males (19 individuals)

Table 3: Distribution of subjects according to parameters.

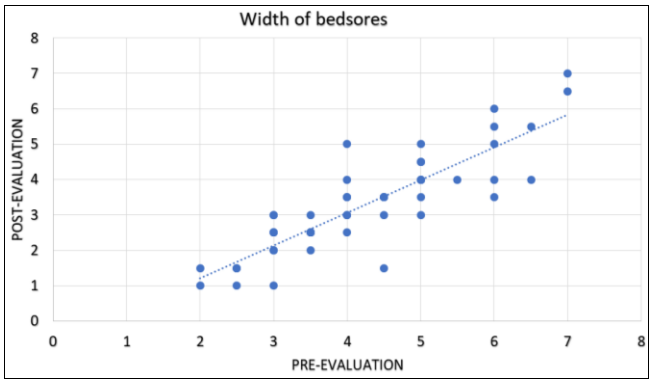
Parameters	Pre-evaluatuon values	Post-evaluation values
Mean	4.260	3.310
Correlation coefficient (r)	0.8597	
P value	< 0.0001, considered extremely significant.	



Graph 3: Distribution of subjects according to parameter.

Interpretation

The above graph represents, total pre-evaluation (4.260) and total post-evaluation (3.310) mean values, with corelation coefficient (r) =0.8597 and p<0.0001 which is considered extremely significant.



Graph 4: Distribution of subjects according to width of bedsores

Interpretation: The above graph represents, pre-evaluation and post-evaluation width of bedsores.

Discussion

The end of this regular review was to identify, assess, and summarise validation to help the development of scrapes in age group of 60 to 80 aged elderly bedridden population having pressure ulcer. The study aimed to establish the range and extent of prevention of scrapes in elderly population. In this study, all the scrapes were grade 1 damage and ultimate of them were located on the sacrum. utmost actors were ladies with an average age of 70 to 80years.There were total 50 actors from which 11 were Males and 31 were Ladies, each of them having grade 1 graze differing in range. Among these 50, 25 were given only bed support and other 25 were given positioning after every 2 hours and bed support at the same time. The subjects' changes were observed for 6 weeks, to know if any goods were seen with bed support with positioning ways and bed support without sticking ways. The primary outgrowth of this review was, about 1 cm difference was seen after giving both bed support (air mattress/ waterbed) as well as the positioning.

Predicated on the former studies, of effectiveness of static air mattress overlays to help pressure ulcers, their primary outgrowth was frequency of pressure ulcer of orders 1 to 4, and their data were reported in a descriptive way to reflect the exploratory nature of the review. The suggestions were that these mattress overlays are more effective in preventing pressure ulcers compared with a standard mattress or a pressure- reducing head mattress in nursing homes and ferocious care setting. No studies reported any differences in effectiveness or patient's comfort and the purchase costs between air mattress/waterbeds compared to a high-technology mattress. still, the available validation should be treated with caution due the wide variety of methodological and/ or reporting quality situations of the included studies. Study quality was a major issue as multitudinous resources were invested in designing clinical studies, with limited donation to the scientific community and clinical practice.

In this study, 62% of population were ladies and 38% of population were males. Distribution of individualities were made according to their age groups, four groups were formed in which 16% of population belonged to group 1, 20% of population belonged to group 2, 34% of population belonged to group 3 and 30 of population belonged to group 4.

The total pre- evaluation mean value (4.260) and post-evaluation mean value (3.310), correlation measure (r) =

0.8597 and $p<0.0001$ values were obtained.

The repositioning has been discussed in the previous research for centuries, with the first recording of Robert Graves in 1848. Logically, repositioning will make a difference to bedsores, the challenge is how the subject must be positioned and hourly position to be changed. In this search evidence-based practice, the role of repositioning does not fit well as there is a clear lack of scientific evidence available to support its practice.

There is a lack of scientific evidence making the availability of bed support with positioning and positioning without bed support as the role does not fit well.

The implication of this observation is that the development of bedsores in this study was not significantly affected by the nature of bed support, whether it was a complete or incomplete co-morbidity, provided that the improvised waterbed/ air mattress was employed. The statistically significant difference in the incidence of bedsores emerged with the use or nonuse of the waterbed/ air mattress, so long as a co-morbidity was already sustained, and not with the completeness or otherwise of the co-morbidity.

We are, compelled to note that the use of the air mattress/ waterbeds among this series of subjects with or without co-morbidity appeared to reduce the incidence of bedsores, whereas the nonuse of the bed supports appeared to have led to an increase in the incidence of the bedsores. The protection conferred by the improvised waterbeds/ air mattress appeared to be independent of the region of the location of bedsores affected and, also influenced by the severity of the co-morbidity.

Future scope of study

- More sample size should be taken.
- The age groups can be varied or can be changed.
- Researchers should consider the limitations of previous studies when designing new research.

Conclusion

Positioning of the subject with the air mattress/water bed and only air mattress/water bed effect was being observed to reduce the pressure ulcers. The use of both (giving positioning and the air mattress/water bed) showed more significant changes and reduced width of the bed sore. By this observation the change of position of the subject with the air mattress/water bed was found to be more effective than, just using air mattress/water bed.

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